GefenPRO®

8x8 DVI Dual Link Matrix w/ Push Button Controls

GEF-DVI-848DL-PB
User Manual

www.gefenpro.com

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Rev A5

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INTRODUCTION

Congratulations on your purchase of the GefenPRO 8x8 DVI Dual Link Matrix with Push Button Controls with Push Button Controls. Your complete satisfaction is very important to us.

GefenPRO

In the realm of video distribution, certain features are invaluable in a commercial or broadcast environment. Accommodations such as a build-in power supply and flat black rack-mount enclosures set GefenPRO apart from our traditional products. Complex distribution units allow for professional DVI, 3G-SDI, and HDMI signals to be routed and converted easily and seamlessly, while being backed up by a renowned and dependable technical support team. Gefen invites you to explore the GefenPRO product line and hopes that you find the solution that fits your needs.

The GefenPRO 8x8 DVI Dual Link Matrix with Push Button Controls

The GefenPRO 8x8 DVI Dual Link Matrix with Push Button Controls provides a professional-grade solution to route up to eight DVI sources to any eight DVI displays. Dual link resolutions up to 3840x2400 are supported. The front panel display shows the current routing status and the front panel push buttons are used to manage local source routing. Four methods are available for controlling the GefenPRO 8x8 DVI Dual Link Matrix: front panel push buttons, IR remote, RS-232 interface, or using IP control with the built-in Web interface.

How It Works

Connect up to eight DVI source devices to the GefenPRO 8x8 DVI Dual Link Matrix with Push Button Controls using the supplied DVI cables. Connect up to eight monitors to the DVI outputs. Plug in the power cord and apply power to the Matrix. The DVI sources will be routed according to the current routing selection.

NOTE: The GefenPRO 8x8 DVI Dual Link Matrix with Push Button Controls only supports DVI-D.

READ THESE NOTES BEFORE INSTALLING OR OPERATING THE GEFENPRO 8X8 DVI DUAL LINK MATRIX WITH PUSH BUTTON CONTROLS

- The 8x8 DVI Dual Link Matrix with Push Button Controls does not support HDCP content.
- When the Matrix is used for the first time, make sure that a DVI monitor is powered and connected to one of the DVI outputs on the 8x8 DVI Dual Link Matrix with Push Button Controls before applying power. By default, the Local EDID is read from the connected monitor and is copied to all 8 DVI inputs once the Matrix has been turned on. If a monitor is not detected by the Matrix at power-on, a default (internal) EDID of 640x480 will be used. This functionality can be disabled using the Secure Local EDID function through RS-232 control. See page 30 for more information.
- There is no internal scaling in the 8x8 DVI Dual Link Matrix with Push Button Controls. Each monitor attached to the Matrix must be able to display the resolutions output by the source device(s). For maximum compatibility it is recommended that only one common resolution be used by each source device.
- Advanced EDID features are accessible through the RS-232 serial command set or using IP Control.

IMPORTANT: If the unit is installed in a closed or multi-rack assembly, do not block the ventilation holes of the enclosure.

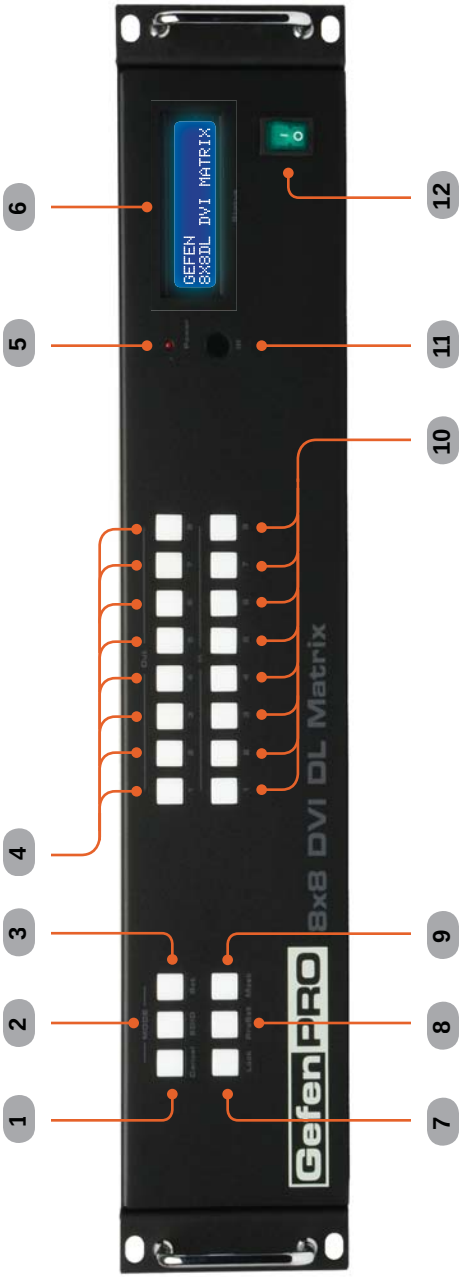
Features

- Increases productivity
- Supports resolutions up to 1920x1200 (Single Link) and 3840x2400 (Dual Link)
- Front panel control buttons for local switching
- Serial RS-232 interface for remote control via a computer or control automation devices
- IP Control
- Discrete IR remote control switching
- Advanced EDID management permits upload of custom internal or external EDID settings
- Supports DDWG standards for DVI
- Built-in power supply
- Output masking command
- Standby mode
- Grounding pin
- IR Sensor
- IR Extender
- Status LCD (shows routing status)
- Firmware upgrade via RS-232
- Power On/Off switch
- Rack-mountable

Package Includes

(1) GefenPRO 8x8 DVI Dual Link Matrix with Push Button Controls
(8) 6 ft. DVI Dual Link cables (M-M)
(1) IR Remote Control Unit
(1) AC Power Cord
(1) User Manual

Front Panel


GEFEN
8X8DL DVI MATRIX
8x8 DVI DL Matrix
GefenPRO
1
2
3
4
5
6
7
8
9
10
11
12

Front Panel

1 Cancel
This button is used to cancel a routing change in progress.

2 EDID
This button is used to manage EDID functions. See pages 17 - 19 for details.

3 Set
This button is used to store and recall EDID and routing functions. See pages 14 - 22 for details.

4 Out (1 - 8)
These buttons are used to select the output when routing a source.

5 Power
This LED will glow bright red when the AC power cord is connected to an available electrical outlet.

6 LCD Display
Displays the current routing status of the Matrix and is also used to manage source routing**.**

7 *Lock*
This button enables / disables the locking of the front panel buttons, preventing accidental changes.

8 *Preset*
The Preset button is used to select or recall stored preset routing states.

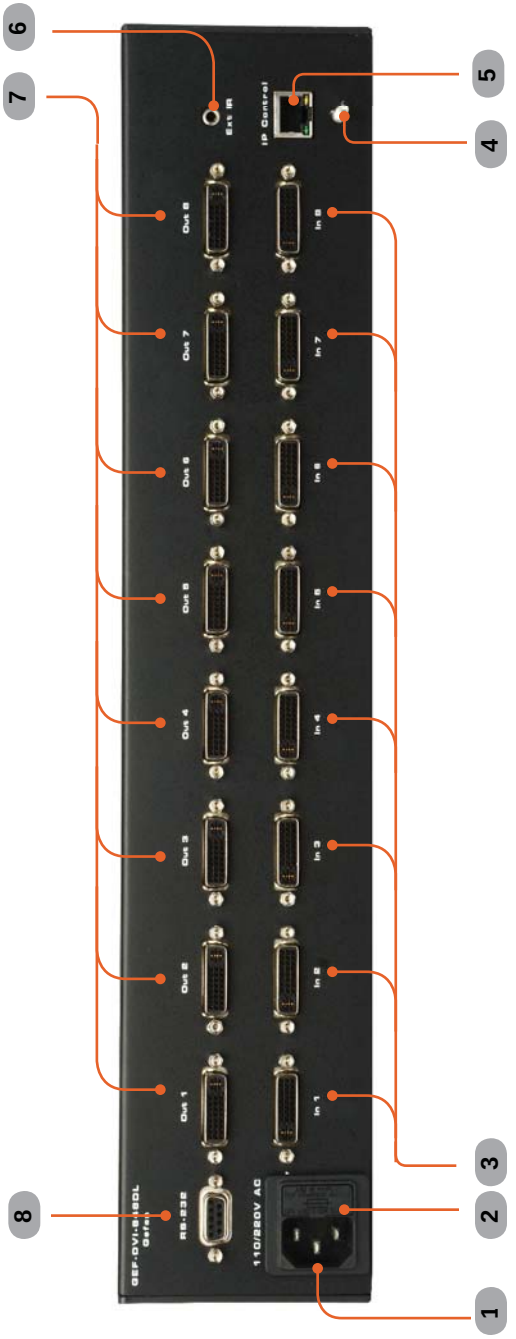
9 *Mask*
This button is used to mask (disable / enable) displays from receiving a video signal from the Matrix.

10 *In (1 - 8)*
These buttons are used to select the input when routing to a display.

11 *IR Window*
Receives signals from the IR Remote Control unit.

12 *Power Switch*
Powers the Matrix ON or OFF.

Back Panel


6
7
5
4
3
8
2
1
Ext IR
IP Control
Out 8
Out 7
Out 6
Out 5
Out 4
Out 3
Out 2
Out 1
In 8
In 7
In 6
In 5
In 4
In 3
In 2
In 1
RS-232
110/220V AC

Back Panel

1 110 / 220 V AC (50 / 60 Hz) Power Receptacle
Connect the included AC power cord from this receptacle to an available electrical outlet.

2 Fuse Drawer
Each power receptacle houses a fuse drawer. Within each fuse drawer are two (2) 250 V fuses. One fuse is active and the other is a spare.

3 DVI Input Ports (1 - 8)
Connect DVI source devices to these ports.

4 Grounding Terminal
Provides a discharge path to ground in case a short circuit occurs between the "hot" lead of the power supply and the enclosure of the Matrix. The grounding wire should be attached from the grounding terminal to an approved ground path.

5 IP Control Interface
Connect to this port to control the 8x8 DVI Dual Link Matrix with Push Button Controls using IP Control. See page 24 for details.

6 IR Extender Port
Connect an IR extender cable to this port (Gefen part no. EXT-RMT-EXTIR).

7 DVI Output Ports 1-8
Connect DVI monitors to these ports.

8 RS-232 Serial Port
Connects to the RS-232 control device. The 8x8 DVI Dual Link Matrix with Push Button Controls may be switched remotely using this port. See page 23 for more information.

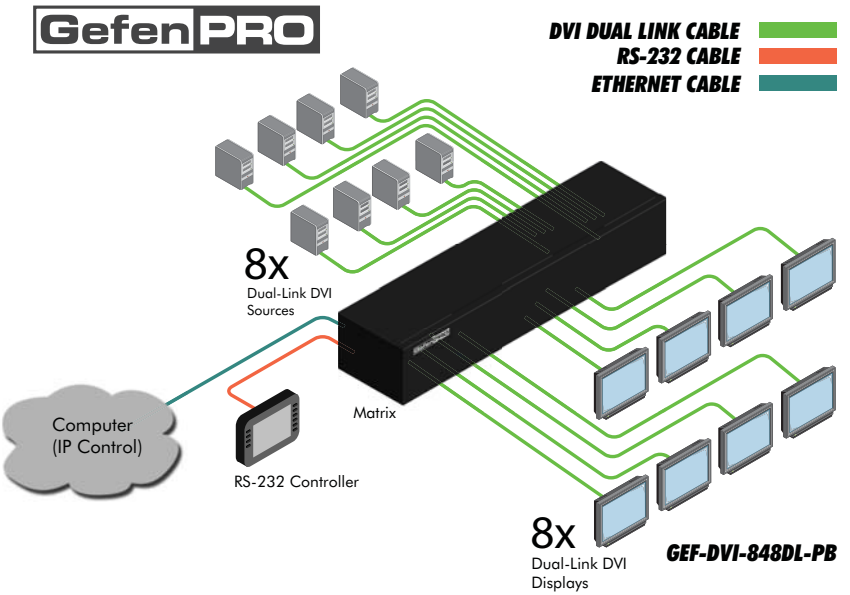
How to Connect the 8x8 DVI Dual Link Matrix with Push Button Controls

1. Connect up to 8 DVI Dual Link source devices to the inputs on the rear panel of the 8x8 DVI Dual Link Matrix with Push Button Controls using the supplied DVI dual link cables.

2. Connect up to 8 DVI Dual Link monitors to the outputs on the rear panel of the 8x8 DVI Dual Link Matrix with Push Button Controls with user-supplied DVI dual link cables.

3. Connect the included AC power cable to the power receptacle on the rear panel of the 8x8 DVI Dual Link Matrix with Push Button Controls and connect the opposite end of the power cable into an available electrical outlet.

Wiring Diagram for the 8x8 DVI Dual Link Matrix with Push Button Controls



ATTENTION: This product should always be connected to a grounded electrical socket.

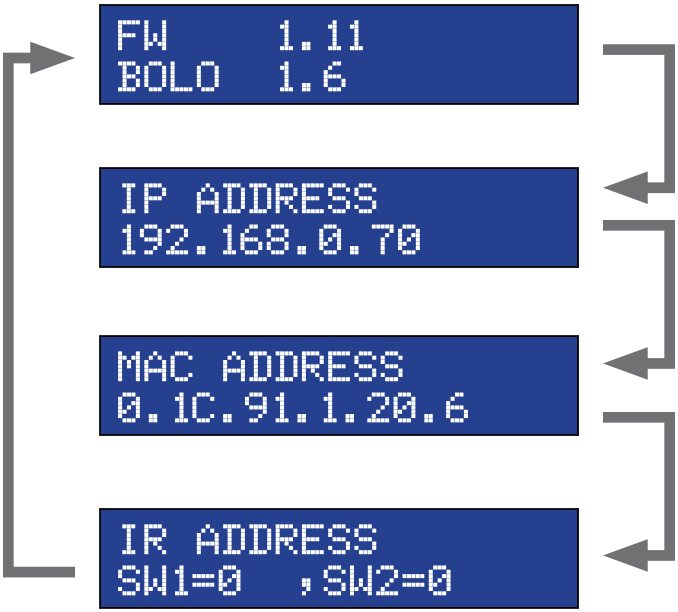
Main Display

The **Main Display** of the GefenPRO 8x8 DVI Dual Link Matrix is a 16-character two-line display. This display will show the standby screen and will also be used to aid in performing routing commands. When the unit is powered on, the following screen is displayed:

After a few moments, the Standby Screen is displayed. The Standby Screen is shown below:

Displaying Additional Information

Pressing the Cancel button, consecutively, will cycle through screens displaying the firmware version and boot loader version, IP address, MAC address, and the IR remote channel:



RMT-8IR
Remote Control Unit

1 ***Activity Indicator***
This LED will be activated momentarily each time a button is pressed.

2 ***Source / Monitor Selection Buttons (1 - 8)***
These buttons are used to select the source and monitor.

See page 13 for information on using the IR Remote Control unit.

NOTE: An Activity Indicator that flashes quickly while holding down any one of the 8 buttons indicates a low battery. Replace the IR Remote Control battery as soon as possible.

Installing the Battery

1. Remove the battery cover on the back of the IR Remote Control unit.
2. Insert the included battery into the open battery slot. The positive (+) side of the battery should be facing up.
3. Replace the battery cover.

The Remote Control unit ships with two batteries. One battery is required for operation and the other battery is a spare.

Empty Battery Slot

CAUTION: Risk of explosion if battery is replaced by an incorrect type. Use only 3V lithium battery type CR-2032.

How to Resolve IR Code Conflicts

In the event that IR commands from other remote controls interfere with the supplied IR Remote Control unit, changing the IR channel on the IR Remote Control unit will fix the problem. The IR Remote Control unit has a bank of DIP switches used for setting the IR channel.

The DIP switch bank is located underneath the battery cover.

Remote Channel 0: Default

Remote Channel 1:

Remote Channel 2:

Remote Channel 3:

Exposed DIP Switch bank between the battery chambers.

It is important that the IR channel on the Remote Control unit, matches the IR channel set on the 8x8 DVI Dual Link Matrix. For example, if both DIP switches on the IR Remote Control unit are set to IR channel 0 (both DIP switches down), then the 8x8 DVI Dual Link Matrix must also be set to IR channel 0. See page 53 for information on how to change the IR channel on the 8x8 DVI Dual Link Matrix.

IR Remote Control Key Mapping

Each input and output on the 8x8 DVI Dual Link Matrix with Push Button Controls is represented by a button on the IR Remote Control unit. The table below lists the corresponding inputs and outputs.

Remote Button	Monitor / Source
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8

Routing Sources using the IR Remote Control unit

Issuing a routing command is a two step process. The first step is to select the monitor where the source will be routed. The second step is to select the source.

Example 1
Route the source device connected to In 7 to the monitor connected to Out 3.

1. Press button 3 (monitor 3) on the IR remote control unit.
2. Press button 7 (source 7) on the IR remote control unit.

The source connected to In 7 will be routed to the monitor connected to Out 3.

Example 2
Route the source device connected to In 1 to the monitor connected to Out 1.

1. Press button 1 (monitor 1) on the IR remote control unit.
2. Press button 1 (source 1) on the IR remote control unit.

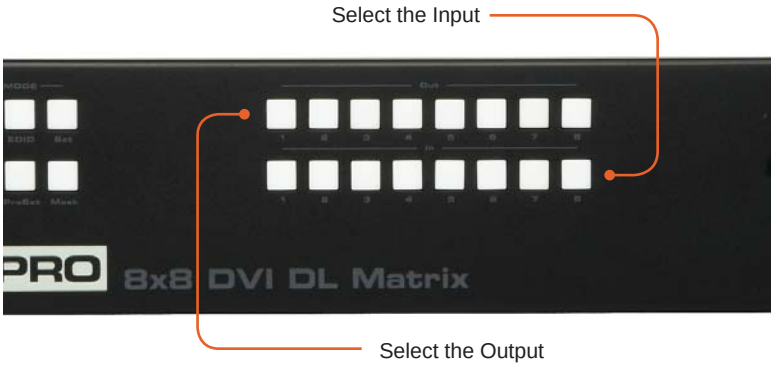
The source connected to In 1 will be routed to the monitor connected to Out 1.

Routing Sources

In order to change current routing state:

1 Press Set Button to activate Routing Mode.

2 Press any Input on the bottom row of buttons (1 - 8). The system indicates the current routing status.



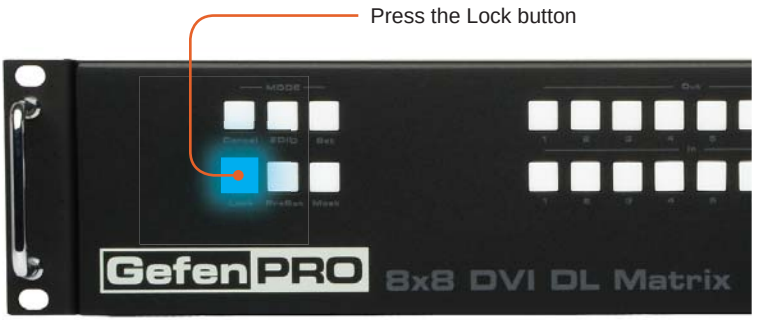
3 Press the desired Output button. One or more Output buttons may be selected.

4 Press the Set button to complete the operation. The system will remain in Routing Mode.

System Lock Mode

Locking the Matrix prevents changes to any of the Matrix settings. This feature is useful in case any of the front panel buttons are pressed by accident. Locking the Matrix also prevents changes using the IR Remote Control Unit.

1 Press the Lock button to activate System Lock Mode.



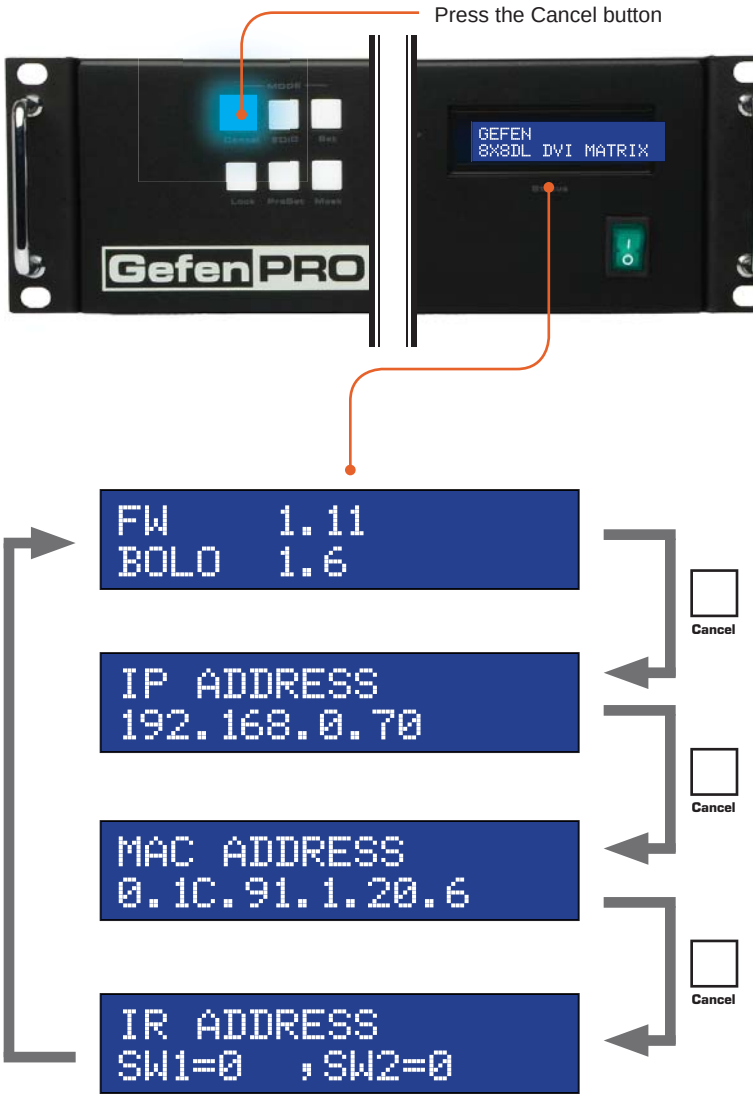
2 Press the Lock button a second time to deactivate System Lock Mode.

Returning to Standby Mode

Press the Cancel button, while in any mode, to return to the Standby Mode screen.

Cycling between Information Screens

Press the Cancel button, while in Status Check Mode, to cycle through the Information Screens.



Activating / Deactivating Standby Mode:

Press and hold the Cancel button for 5 seconds to activate or deactivate Standby Mode.

Saving the Downstream EDID to Local Memory:

1 Press EDID button *once* to activate DSTOLO (Downstream To Local) Mode.

2 Press the Output button to select the EDID data source.

3 Press the Input button to select EDID data destination.

4 Press the Set button to complete the operation. The system will remain in DSTOLO mode.

Saving the default EDID to Local Memory

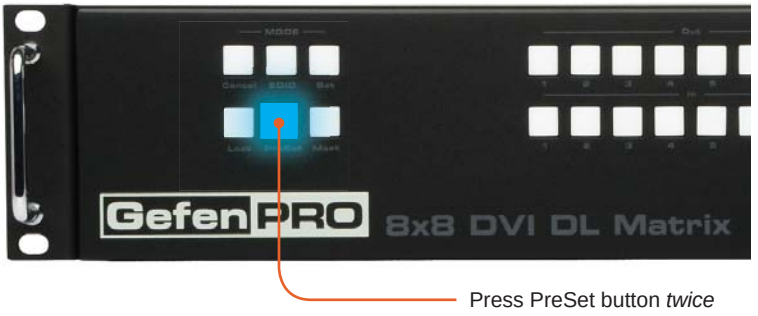
1 Press the EDID button *twice* to activate DETOLO (Default EDID To Local) Mode.

2 Press the Input button to select EDID data destination.

3 Press the Set button to complete the operation. The system will remain in DETOLO mode.

Saving the current Routing State

1 Set the routing state (see page 14), then press the PreSet button *twice* to activate Preset Mode.



2 Press an Input button (1 - 8) to store the current routing state.

3 Press the Set button to complete the operation. The system will remain in Save Current Preset Mode.

Recalling a Routing State

1 Press the PreSet button *once* to activate Recall Preset Mode.

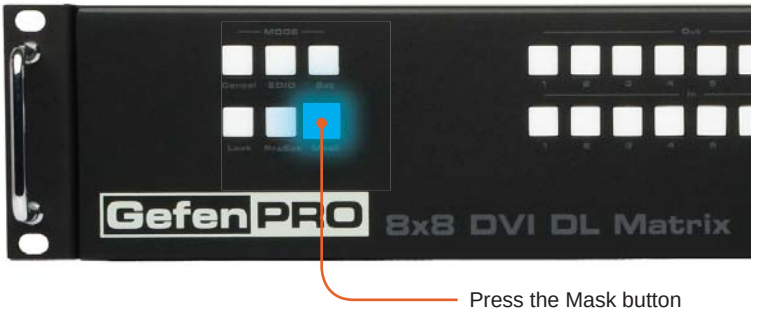
2 Press the Input button (1 - 8) of the routing state to be recalled.

3 Press the Set button to complete the operation. The system will remain in Recall Saved Set Mode.

Masking Outputs

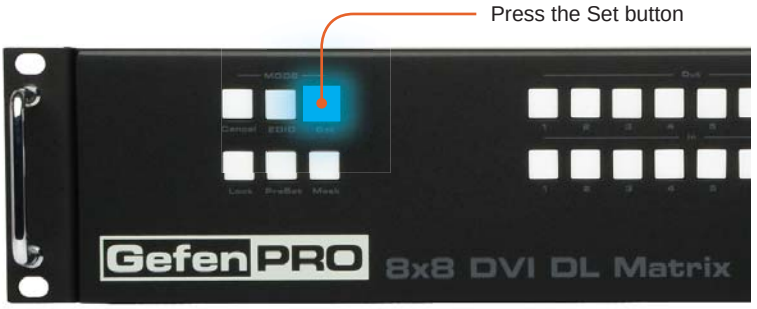
Masking prevents the output device (display, etc) from receiving an output signal, instead of powering-down the output device. The masking process is identical for masking or unmasking outputs.

1 Press the Mask button to activate Mask Mode.



2 Select the Output to be masked.

3 Press the Set button to complete the operation. The system will remain in Save Current Preset Mode.



Only Pins 2 (RX), 3 (TX), and 5 (Ground) are used on the RS-232 serial interface

RS232 Settings

Bits per second 19200

Data bits 8

Parity ..... None

Stop bits 1

Flow Control ..... None

IMPORTANT: When sending RS-232 commands, a *carriage return* and a *line feed* character must be included at the end of each line. RS-232 / Telnet commands, parameters, and device names are *not* case-sensitive.

Configuring the IP Address

The *8x8 DVI DL Matrix* supports IP-based control using Telnet or the built-in Web-based GUI. To set up IP control, the network settings for the *8x8 DVI DL Matrix* must be configured via RS-232. The default network settings for the matrix are as follows:

IP Address:	`192.168.1.72`
Subnet:	`255.255.255.0`
Gateway:	`192.168.1.254`
HTTP Port:	`80`
Telnet Port:	`23`

1. Connect an RS-232 cable from the PC to the *8x8 DVI DL Matrix*.

2. Launch a terminal emulation program (e.g. HyperTerminal) and use the following settings:

Baud Rate:	19200
Data Bits:	8
Parity:	None
Stop Bits:	1
Flow Control:	None

> **NOTE:** Depending upon the network, the IP address, subnet mask, gateway IP, Telnet port, and HTTP port will need to be set. Consult your network administrator to obtain the proper settings.

3. Set the IP address for the matrix using the `#sipadd` command (see page 41 for details).

4. Set the subnet mask using the `#snetmask` command (see page 42 for details).

5. Set the gateway (router) IP address using the `#sgateway` command (see page 39 for details).

6. Set the Telnet listening port using the `#set_telnet_port` command (see page 38 for details).

7. Set the HTTP listening port using the `#set_http_port` command (see page 37 for details).

8. Power-cycle the matrix to reboot and complete all IP setting changes.

9. Type the IP address that was specified in step 3, in a web browser to access the Web GUI or use the same IP address to Telnet to the matrix.

EDID Management

Command	Description
#dynamic_edid	Enables / disables dynamic EDID
#edidbatolo	Read downstream EDID and stores in any Local Input
#ediddetolo	Sets Local EDID to Default EDID
#ediddstoba	Read downstream EDID and stores in EDID Bank
#ediddstolo	Read downstream EDID and stores into a Local EDID
#lock_edid	Secures Local EDID
#prbaedid	Read EDID from an EDID bank and sends to serial port
#prdsedid	Read downstream EDID and sends to serial port
#predidst	Prints EDID details
#prloedid	Read Input Local EDID and sends to serial port

#dynamic_edid Command

The #dynamic_edid command provides the ability to route any downstream EDID to any input. When enabled, the EDID is copied to all inputs from the last selected active output. When disabled, the EDID is copied to all inputs from the first active display detected, starting from Output 1.

Syntax:

```
#dynamic_edid param1
```

Parameters:

param1 Value [0 - 1]

Value	Meaning
0	Disable
1	Enable

Notes:
The default setting for Dynamic EDID is *disabled*.

Example:

```
#dynamic_edid 1
Enable Dynamic EDID mode
```

#edidbatolo Command

The #edidbatolo command reads the downstream EDID and stores it to any local input. Up to eight inputs can be specified.

Syntax:

```
#edidbatolo param1 param2 [param3...param9]
```

Parameters:

param1	EDID bank offset	[1 - 3]
param2	Input	[1 - 8]

Notes:
If *param2 = 0*, then the EDID in the specified bank is copied to all eight inputs.

Examples:

```
#edidbatolo 2 3
Finished reading EDID from bank 2

Finished loading EDID to local 3


#edidbatolo 4 0
Finished reading EDID from bank 4

Finished loading EDID to local 1

Finished loading EDID to local 2

Finished loading EDID to local 3

Finished loading EDID to local 4

Finished loading EDID to local 5

Finished loading EDID to local 6

Finished loading EDID to local 7

Finished loading EDID to local 8
```

#ediddetolo Function

The #ediddetolo function stores the Default EDID (640x480) in the specified Local EDID inputs. Up to eight inputs can be specified.

Syntax:

```
#ediddetolo param1 [param2...param9]
```

Parameters:

param1	Input	[1 - 8]

Notes:

If *param1 = 0*, then all 8 DVI inputs will be set to the Default EDID.

Examples:

```
#ediddetolo 7

Finished loading EDID to local 7


#ediddetolo 0

Finished loading EDID to local 1

Finished loading EDID to local 2

Finished loading EDID to local 3

Finished loading EDID to local 4

Finished loading EDID to local 5

Finished loading EDID to local 6

Finished loading EDID to local 7

Finished loading EDID to local 8
```

#ediddstoba Function

The #ediddstoba function reads the downstream EDID and stores it to a specified EDID bank.

Syntax:

```
#ediddstoba param1 param2
```

Parameters:

param1	A downstream monitor	[1 - 8]
param2	EDID bank offset	[1 - 3]

Example:

```
#ediddstoba 4 2

Finished reading EDID from output 4

Finished loading EDID to bank 2
```

#ediddstolo Function
The #ediddstolo function reads the downstream EDID and stores it to a Local EDID input.

Syntax:

```
#ediddstolo param1 param2 [param3...param9]
```

Parameters:

param1	A downstream monitor	[1 - 8]
param2	Input list	[1 - 8]

Notes:

If *param2 = 0*, then the downstream EDID is stored to all 8 DVI inputs.

Examples:

```
#ediddstolo 2 3
Finished reading EDID from output 2
Finished loading EDID to local 3

#ediddstolo 2 0
Finished reading EDID from output 2
Finished loading EDID to local 1
Finished loading EDID to local 2
Finished loading EDID to local 3
Finished loading EDID to local 4
Finished loading EDID to local 5
Finished loading EDID to local 6
Finished loading EDID to local 7
Finished loading EDID to local 8
```

#lock_edid Function

The #lock_edid function secures the Local EDID and disables the automatic loading of the downstream EDID after the Matrix is powered on.

Syntax:

```
#lock_edid param1
```

Parameters:

param1 Input [0 - 1]

Value	Meaning
0	Disable
1	Enable

Example:

```
#lock_edid 0

Disable Lock EDID mode
```

#prbaedid Function

The #prbaedid function reads the EDID file from the specified bank and sends to serial port.

Syntax:

```
#prbaedid param1
```

Parameters:

param1	Input	[1 - 3]

Example:

```
#prbaedid 2

Finished reading EDID from bank 2

0x00 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0x00
0x4C 0x2D 0xAC 0x06 0x01 0x00 0x00 0x00
0x34 0x13 0x01 0x03 0x80 0x66 0x39 0x78
0x0A 0xEE 0x91 0xA3 0x54 0x4C 0x99 0x26
0x0F 0x50 0x54 0xBD 0xEF 0x80 0x71 0x4F
0x81 0x00 0x81 0x40 0x81 0x80 0x95 0x00
0x95 0x0F 0xB3 0x00 0xA9 0x40 0x02 0x3A
0x80 0x18 0x71 0x38 0x2D 0x40 0x58 0x2C
0x45 0x00 0xA0 0x5A 0x00 0x00 0x00 0x1E
0x66 0x21 0x50 0xB0 0x51 0x00 0x1B 0x30
0x40 0x70 0x36 0x00 0xA0 0x5A 0x00 0x00
0x00 0x1E 0x00 0x00 0x00 0xFD 0x00 0x18
0x4B 0x1A 0x51 0x17 0x00 0x0A 0x20 0x20
0x20 0x20 0x20 0x20 0x00 0x00 0x00 0xFC
0x00 0x53 0x41 0x4D 0x53 0x55 0x4E 0x47
0x0A 0x20 0x20 0x20 0x20 0x20 0x01 0x59
0x02 0x03 0x29 0xF1 0x46 0x90 0x04 0x05
0x03 0x20 0x22 0x23 0x09 0x07 0x07 0x83
0x01 0x00 0x00 0xE2 0x00 0x0F 0xE3 0x05
0x03 0x01 0x6E 0x03 0x0C 0x00 0x20 0x00
.
.
.
0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x65
```

#prdsedid Function

The #prdsedid function reads the downstream EDID and sends it to the serial port.

Syntax:

```
#prdsedid param1
```

Parameters:

param1	A downstream monitor	[1 - 8]

Example:

```
#prdsedid 2

Finished reading EDID from output 2

0x00 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0x00
0x4C 0x2D 0xAC 0x06 0x01 0x00 0x00 0x00
0x34 0x13 0x01 0x03 0x80 0x66 0x39 0x78
0x0A 0xEE 0x91 0xA3 0x54 0x4C 0x99 0x26
0x0F 0x50 0x54 0xBD 0xEF 0x80 0x71 0x4F
0x81 0x00 0x81 0x40 0x81 0x80 0x95 0x00
0x95 0x0F 0xB3 0x00 0xA9 0x40 0x02 0x3A
0x80 0x18 0x71 0x38 0x2D 0x40 0x58 0x2C
0x45 0x00 0xA0 0x5A 0x00 0x00 0x00 0x1E
0x66 0x21 0x50 0xB0 0x51 0x00 0x1B 0x30
0x40 0x70 0x36 0x00 0xA0 0x5A 0x00 0x00
0x00 0x1E 0x00 0x00 0x00 0xFD 0x00 0x18
0x4B 0x1A 0x51 0x17 0x00 0x0A 0x20 0x20
0x20 0x20 0x20 0x20 0x00 0x00 0x00 0xFC
0x00 0x53 0x41 0x4D 0x53 0x55 0x4E 0x47
0x0A 0x20 0x20 0x20 0x20 0x20 0x01 0x59
0x02 0x03 0x29 0xF1 0x46 0x90 0x04 0x05
0x03 0x20 0x22 0x23 0x09 0x07 0x07 0x83
0x01 0x00 0x00 0xE2 0x00 0x0F 0xE3 0x05
0x03 0x01 0x6E 0x03 0x0C 0x00 0x20 0x00
.
.
.
0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x65
```

#predidst Function

The #predidst function reads the downstream EDID. This function displays a table containing details relating to the Local EDID and the monitor name.

Syntax:

```
#prdsedid
```

Parameters:

None

Example:

```
#predidst
```

```
Input  |  Source   | Name
-------|-----------|------
 1     |   Default | GEFEN_XPT_DL
 2     |  Output_1 |
 3     |   Default | GEFEN_XPT_DL
 4     |   Default | GEFEN_XPT_DL
 5     |  External | SAMSUNG
 6     |  Output_1 |
 7     |  Output_1 |
 8     |  Output_1 |
```

#prloedid Function

The #prloedid function reads the local EDID of a specified input and spools it to the serial port.

Syntax:

```
#prloedid param1
```

Parameters:

param1	A specified Input	[1 - 8]

Example:

```
#prloedid 1

Finished reading EDID from Local EDID input 1


0x00 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0x00
0x1C 0xA6 0x00 0x01 0x00 0x00 0x00 0x01
0x01 0x14 0x01 0x03 0x80 0x50 0x2D 0x78
0x0A 0x0D 0xC9 0xA0 0x57 0x47 0x98 0x27
0x12 0x48 0x4C 0x21 0x4F 0x00 0x81 0x00
0xA9 0x40 0xD1 0x00 0x71 0x40 0x01 0x01
0x01 0x01 0x01 0x01 0x01 0x01 0x30 0x2A
0x00 0x98 0x51 0x00 0x2A 0x40 0x30 0x70
0x13 0x00 0x52 0x0E 0x11 0x00 0x00 0x1E
0xB0 0x68 0x00 0xA0 0xA0 0x40 0x2E 0x60
0x30 0x20 0x36 0x00 0x81 0x90 0x21 0x00
0x00 0x1E 0x00 0x00 0x00 0xFC 0x00 0x47
0x45 0x46 0x45 0x4E 0x5F 0x58 0x50 0x54
0x5F 0x44 0x4C 0x20 0x00 0x00 0x00 0xFD
0x00 0x3B 0x3D 0x0F 0x71 0x1C 0x00 0x0A
0x20 0x20 0x20 0x20 0x20 0x20 0x00 0x3C
```

IP / Telnet Configuration

Command	Description
#display_telnet_welcome	Set Telnet welcome message on login
#ipconfig	Displays all TCP/IP settings
#resetip	Resets IP configuration to factory settings
#set_http_port	Sets the Web server listening port
#set_telnet_pass	Prompts for password when using Telnet
#set_telnet_port	Sets the Telnet listening port
#set_telnet_username	Sets the user name for the login procedure
#sgateway	Sets the IP gateway address
#show_telnet_pass	Prompts for password when using Telnet
#show_telnet_username	Prompts for user name when using Telnet
#show_ver_data	Displays the hardware and firmware version of the matrix
#sipadd	Sets the IP address of the matrix
#snetmask	Sets the IP network mask
#use_telnet_pass	Use password during Telnet sessions

#display_telnet_welcome Command

The #display_telnet_welcome command sets (enables/disables) the Telnet welcome message on login.

Syntax:

```
#display_telnet_welcome param1
```

Parameters:

param1 State [0 - 1]

State	Meaning
0	Do not display welcome message
1	Display welcome message

Example:

```
#display_telnet_welcome 1

Telnet welcome at login is set to ON
```

#ipconfig Command

The #ipconfig command displays the current TCP/IP settings for the matrix.

Syntax:

```
#ipconfig
```

Parameters:

None

Example:

```
#ipconfig

-------------- TCP/IP settings -------------

MAC add  = 00:1C:91:01:50:07
IP add   = 192.168.1.72
Net Mask = 255.255.255.0
Gateway  = 192.168.2.1
Web Server Port = 80
Telnet Server Port = 23
Telnet password at logın ıs set to ON
Telnet welcome at logın ıs set to ON
```

#resetip Command

The #resetip command resets all TCP/IP settings to factory defaults.

Syntax:

```
#resetip
```

Parameters:

None

Notes:
The matrix must be rebooted after executing this command.

Example:

```
#resetip
Reset ip configuration to factory default
```

#set_http_port Command

The #set_http_port command sets the Web server listening port.

Syntax:

```
#set_http_port param1
```

Parameters:

param1	Port	[0 - 65535]

Notes:
The default port setting is *80*.
The matrix must be rebooted after executing this command.

Example:

```
#set_http_port 34
New HTTP port set to: 34
```

#set_telnet_pass Command

The #set_telnet_pass command sets the Telnet password. The maximum length of the password is 20 characters. The password is case-sensitive.

Syntax:

```
#set_telnet_pass param1
```

Parameters:

param1	Password	

Notes:
The default password is *Admin*.
The matrix must be rebooted after executing this command.

Example:

```
#set_telnet_pass reindeer
Telnet password updated to: reındeer
```

#set_telnet_port Command

The #set_telnet_port command sets the Telnet listening port.

Syntax:

```
#set_telnet_port param1
```

Parameters:

param1	Port	[0 - 65535]

Notes:
The default port setting is *23*.
The matrix must be rebooted after executing this command.

Example:

```
#set_telnet_port 80
New Telnet port set to: 80
```

#set_telnet_username Command

The #set_telnet_username command sets the Telnet user name. The maximum length of the user name is 20 characters. The user name is case-sensitive.

Syntax:

```
#set_telnet_username param1
```

Parameters:

param1	User name

Notes:
The default username is *Admin*.
The matrix must be rebooted after executing this command.

Example:

```
#set_telnet_username andrew
Telnet login updated to: andrew
```

#sgateway Command

The #sgateway sets the IP gateway (router) address. Dot-decimal notation must be used when specifying the IP address. The default address is 192.168.1.254.

Syntax:

```
#sgateway param1
```

Parameters:

param1	IP gateway

Notes:
The default gateway IP address is *192.168.1.254*

The matrix must be rebooted after executing this command.

Example:

```
#sgateway 192.168.1.1
New IP Gateway set to: 192.168.1.1
```

#show_telnet_pass Command

The #show_telnet_pass command shows the Telnet password for login (if required).

Syntax:

```
#show_telnet_pass
```

Example:

```
#show_telnet_pass
Telnet password: reindeer
```

#show_telnet_username Command

The #show_telnet_username command returns the user name required for login.

Syntax:

```
#show_telnet_username
```

Parameters:

None

Example:

```
#show_telnet_username
Telnet login: andrew
```

#show_ver_data Command

The #show_ver_data command displays the hardware and firmware version of the matrix.

Syntax:

```
#show_ver_data
```

Parameters:

None

Example:

```
#show_ver_data

Hardware version 1
Firmware Release version 2.0.33
Release data: Jun 17 2012
Release time: 16:50:58
Boot loader version 1.6
```

#sipadd Command

The #sipadd command sets the IP address of the matrix. Dot-decimal notation must be used when specifying the IP address.

Syntax:

```
#sipadd param1
```

Parameters:

param1	IP address

Notes:
The matrix must be rebooted after executing this command.

Example:

```
#sipadd 192.168.1.72
New IP set to: 192.168.1.72
```

#snetmask Command

The #snetmask command sets the IP network mask. Dot-decimal notation must be used when specifying the IP network mask.

Syntax:

```
#snetmask param1
```

Parameters:

param1 Network mask

Notes:
The default net mask is set to *255.255.255.0*
The matrix must be rebooted after executing this command.

Example:

```
#snetmask 255.255.0.0
New IP Mask set to: 255.255.0.0
```

#use_telnet_pass Command

The #use_telnet_pass command requires or disables login credentials.

Syntax:

```
#use_telnet_pass param1
```

Parameters:

param1 State [0 - 1]

Value	Meaning
0	Disable password
1	Enable (force) password

Notes:
The default setting is *disabled*

Example:

```
#use_telnet_pass 1
Telnet password at login is set to ON
```

Routing

Command	Description
#callpreset	Recalls a routing / mask preset
#prpreset	Prints the routing preset table
#savepreset	Saves the current routing/masking state to a preset
r	Routes the specified inputs to the specified outputs
s	Routes the specified input to all outputs

#callpreset Command

The #callpreset command recalls a routing preset. Any masked outputs will also be recalled.

Syntax:

```
#callpreset param1
```

Parameters:

param1	Preset	[1 - 8]

Example:

```
#callpreset 4
Recall Saved Set 4
```

#prpreset Command

The #prpreset command displays the routing preset table.

Syntax:

```
#prpreset
```

Parameters:

None

Example:

```
#prpreset

PreSet|Out1| 2 | 3 | 4 | 5 | 6 | 7 | 8
------|----|---|---|---|---|---|---|----
  1   |M 0 |M 0|M 0|M 0|M 0|M 0|M 0|M 0
  2   |A 1 |A 1|A 3|A 4|A 5|A 1|A 7|A 8
  3   |M 0 |M 0|M 0|M 0|M 0|M 0|M 0|M 0
  4   |M 0 |M 0|M 0|M 0|M 0|M 0|M 0|M 0
  5   |M 0 |M 0|M 0|M 0|M 0|M 0|M 0|M 0
  6   |M 0 |M 0|M 0|M 0|M 0|M 0|M 0|M 0
  7   |M 0 |M 0|M 0|M 0|M 0|M 0|M 0|M 0
  8   |M 0 |M 0|M 0|M 0|M 0|M 0|M 0|M 0
------|----|---|---|---|---|---|---|----
```

#savepreset Command

The #savepreset command saves the current routing state to the specified preset. Any masked outputs will also be saved as part of the current routing state.

Syntax:

```
#savepreset param1
```

Parameters:

param1	Preset	[1 - 8]

Example:

```
#savepreset 5
Saved current as set 5
```

r Command

The r command routes the specified input to the specified outputs.

Syntax:

```
r param1 param2 [param3...param9]
```

Parameters:

param1	Input	[1 - 8]
param2	Outputs	[1 - 8]

Notes:

If *param2* = 0, then the specified input is routed to all outputs.

Examples:

```
r 7 3 4 5 6 1 2
Input 7 is routed to outputs: 3 4 5 6 1 2
```

If *Dynamic EDID* (see page 25) is enabled, then the last output in the list will be saved to the specified input (*param1*), as shown below:

```
r 7 3 4 5 6 1 2
Input 7 is routed to outputs: 3 4 5 6 1 2
Finished reading EDID from output 2
Finished loading EDID to local 7


r 1 0
All outputs are routed to input 1
```

s Command

The s command routes the specified input to all outputs.

Syntax:

```
s param1
```

Parameters:

param1	Input	[1 - 8]

Example:

```
s 1
All outputs are routed to ınput 1
```

Masking

Command	Description
#maskout	Masks the selected (video) output(s)
#unmaskout	Unmasks the selected output(s)

#maskout Command

The #maskout command allows blanking of the specified outputs.

Syntax:

```
#maskout param1 param2
```

Parameters:

param1	Output	[1 - 8]
param2	State	[0 - 1]

Value	Meaning
0	Active
1	Mask

Notes:

The current masking state will be lost if power is interrupted or if the masking state is not saved (see #savepreset on page 45).

Example:

```
#maskout 2 0
Mask outputs: 2
```

#unmaskout Command

The #unmaskout command unmasks the specified outputs. If *param1* = 0, then all outputs will be unmasked.

Syntax:

```
#unmaskout param1...param8
```

Parameters:

param1	Output	[1 - 8]

Examples:

```
#unmaskout 3 5 7
Activate outputs: 3 5 7

#unmaskout 0
Activate all outputs
```

Miscellaneous

Command	Description
#activebolo	Activates the boot loader
#fadefault	Resets the matrix to factory default routing
#help	Displays all available commands
#lock_fo	Toggles the +5V lock power state
#set_input_name	Specifies a name for an input
#set_ir	Sets the IR channel of the matrix
#set_output_name	Specifies a name for an output
#show_temp	Displays the voltages of the internal boards
#show_voltage	Displays the voltages of the internal boards
f	Toggles / displays +5V input
l	Displays the dual-link / single-link status table
m	Displays the current routing status

#activebolo Command

The #activebolo command activates the boot loader. This command is used when updating the matrix firmware. See page 75 for details on this procedure.

Syntax:

```
#activebolo
```

Parameters:

None

Example:

```
#activebolo

To download the file DVI8x8DL please type the command
'activebolo 0'
To download the file GEFMTXFP please type the command
'activebolo 1'
```

#fadefault Command

The #fadefault command disables the EDID lock state, sets the default routing state (1-1, 2-2, 3-3, etc.) and resets the input and output names to the default names (e.g. Output 1, Input 1).

Syntax:

```
#fadefault
```

Parameters:

None

Example:

```
#fadefault

Return to factor default
Loadıng default EDID
Routed 1-1, 2-2..
Finished loading EDID to local 1
Finished loading EDID to local 2
Finished loading EDID to local 3
Fınished loadıng EDID to local 4
Fınished loadıng EDID to local 5
Finished loading EDID to local 6
Finished loading EDID to local 7
Finished loading EDID to local 8
```

#help Command

The #help command displays help on the specified command. If *param1* is not specified, then the full list of commands is displayed.

Syntax:

```
#help [param1]
```

Parameters:

param1 Command name

Example:

```
#help #callpreset

Cmd #callpreset: Recall a routing and mask state preset
Syntax: #callpreset param1
Param1 = 1-8 (preset)
 e.g: #callpreset 2
```

#lock_fo Command

The #lock_fo enables/disables the power lock state. Enabling this feature will store the +5V status for each input prior to shutting down the matrix. This command preserves the +5V state when the unit is restarted.

Syntax:

```
#lock_fo param1
```

Parameters:

param1 State [0 - 1]

Value	Meaning
0	Disable power lock
1	Enable power lock

Example:

```
#lock_fo 0
Disable Lock power mode
```

#set_input_name Command

The #set_input_name command provides a name to the selected input. For example, “Input 1” could be renamed as “Computer 1”. The maximum string length for *param2* is 15 characters. Special characters and spaces are not permitted. If required, use the underscore character (“_”) to separate characters.

Syntax:

```
#set_input_name param1 param2
```

Parameters:

param1	Input	[1 - 8]
param2	Name	

Example:

```
#set_input_name 5 computer1
computer1 is assigned to input 5
```

#set_ir Command

The #set_ir set the IR channel for the matrix. The associated DIP switch settings for the IR remote control unit are returned. See page 12 for details on setting the IR channel for the IR remote control.

Syntax:

```
#set_ir param1
```

Parameters:

param1	Channel	[0 - 3]

Example:

```
#set_ir 2
RMT_IR - SW1=0,SW2=1
```

#set_output_name Command

The #set_output_name command provides a name to the selected output. For example, “Output 1” could be renamed as “HDDisplay”. The maximum string length for *param2* is 15 characters. Special characters and spaces are not permitted. If required, use the underscore character (“_”) to separate characters.

Syntax:

```
#set_output_name param1 param2
```

Parameters:

param1	Output	[1 - 8]
param2	Name	

Example:

```
#set_output_name 3 display_3
display_3 is assigned to output 3
```

#show_temp

The #show_temp command provides temperature information for the matrix.

Syntax:

```
#show_temp
```

Parameters:

None

Example:

```
#show_temp

Temperature near main power supply is 45
Temperature near cross point is 53
Temperature near power supply input board is 47
```

#show_voltage

The #show_voltage command provides voltage information for the matrix.

Syntax:

```
#show_voltage
```

Parameters:

None

Example:

```
#show_voltage

Voltage 3.3 , measured 3344 mV
Voltage 5   , measured 5036 mV
Voltage 12  , measured 11905 mV
Voltage 1.2 , measured 1200 mV
Voltage 1.8 , measured 1800 mV
Voltage 3.3 , measured 3265 mV
```

f Command

Enables / disables 5V on pin 14 of the specified DVI input. This command is used when connecting the Receiver module of fiber optic extenders, which require 5V.

WARNING: Before connect a computer to the DVI input, make sure to disable the 5V on the DVI input. Otherwise, the video card on the computer may become damaged.

Syntax:

```
f param1 param2
```

Parameters:

param1	Input	[1 - 8]
param2	State	[0 - 1]

State	Meaning
0	Disable 5V
1	Enable 5V

Example:

```
f 1 1
Enable FO 1
```

I Command

The I (lower-case “L”) command displays the link status of each input. If the input is receiving a dual-link signal, then the Link status will be set to “Dual”. If a single-link source is used, then the Link status will be set to “Single”.

Syntax:

```
I
```

Parameters:

None

Example:

```
I
Input   |  Signal  | Link
--------|----------|--------
  1     |    NONE  | Single
  2     |    NONE  | Single
  3     |    NONE  | Single
  4     |    NONE  | Single
  5     |    NONE  | Single
  6     |    NONE  | Single
  7     |    NONE  | Single
  8     |    NONE  | Single
--------|----------|--------
```

m Command

The m command displays the current matrix status and routing information.

Syntax:

m

Parameters:

None

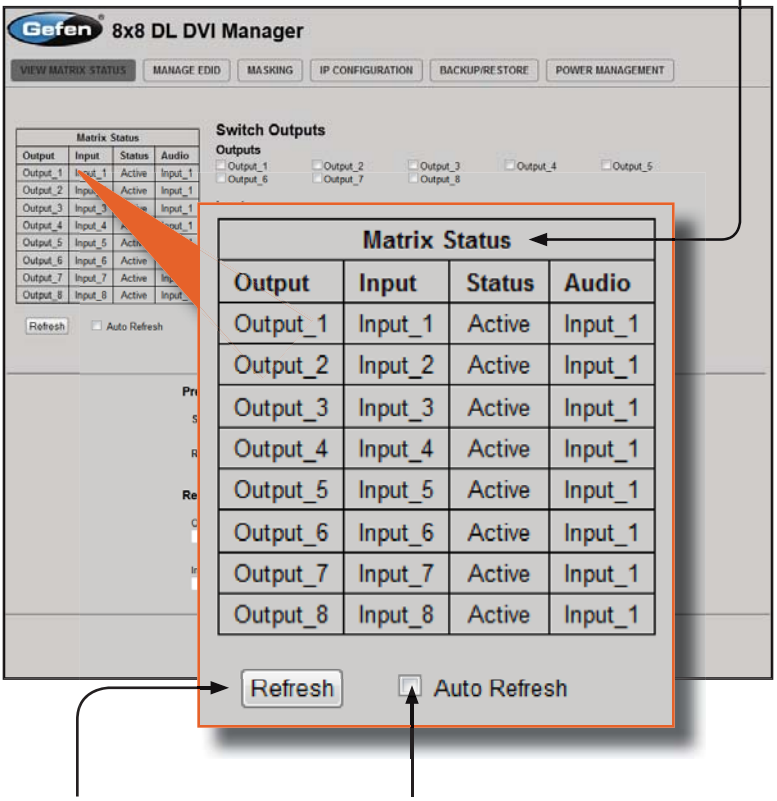
Example:

m

```
  Output       |   Input        |  HPD  | Status
---------------|----------------|-------|--------
       Output_1|         Input_1|   LOW | ACTIVE
       Output_2|         Input_2|  HIGH | ACTIVE
       Output_3|         Input_3|   LOW | ACTIVE
       Output_4|         Input_4|   LOW | ACTIVE
       Output_5|         Input_5|   LOW | ACTIVE
       Output_6|         Input_6|   LOW | ACTIVE
       Output_7|         Input_7|   LOW | ACTIVE
       Output_8|         Input_8|   LOW | ACTIVE
---------------|----------------|-------|--------
EDID lock state
Power lock state
RMT_IR - SW1=0,SW2=1
```

View Matrix Status

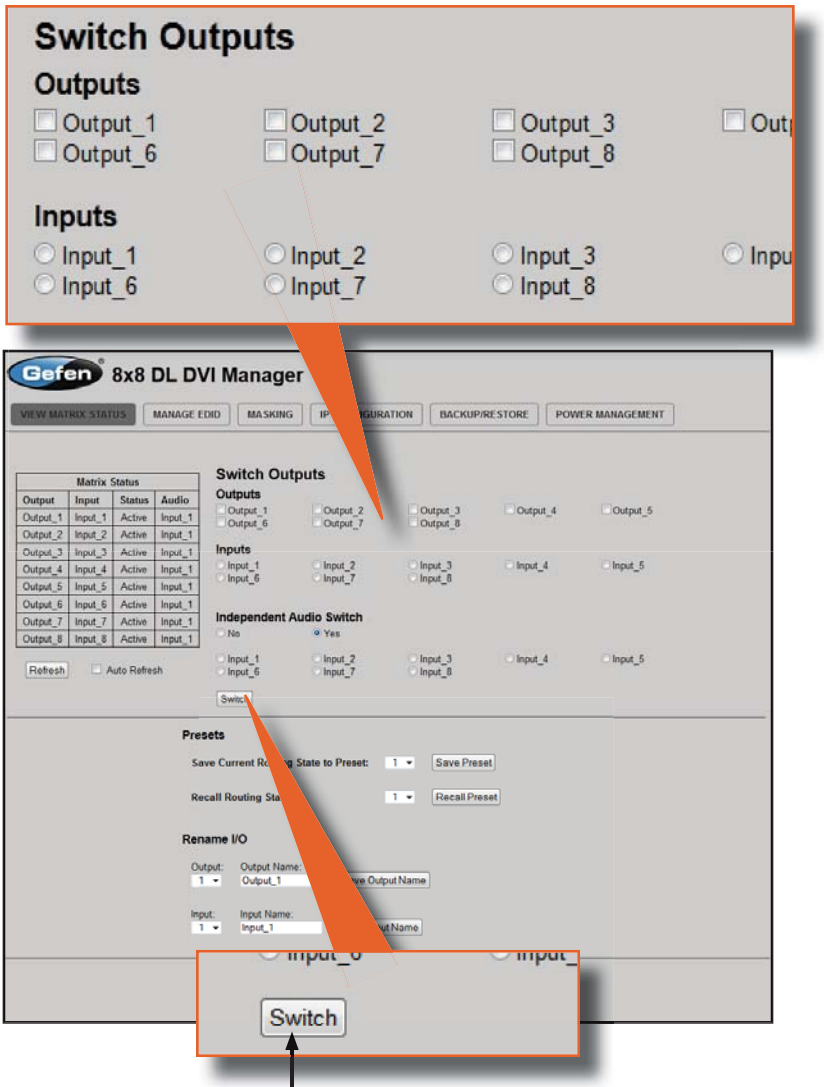
Matrix Status
Displays the current routing status of each input and output on the matrix.



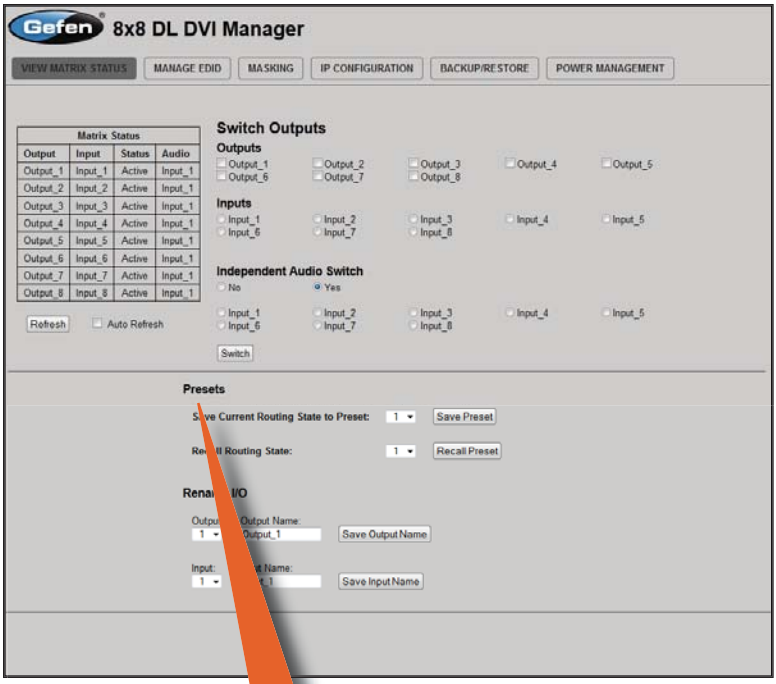
Refresh
Click to refresh the Matrix Status screen

Auto Refresh
Check this box to enable Auto Refresh. The Auto Refresh function automatically refreshes the interface every 10 seconds.

Switch Outputs
Used to route the specified input to the selected output(s). To route a source, place a check mark next to each Output. Next, click the radio button next to the desired Input. Press the Switch button to apply the routing change.



Switch
Click this button to apply the routing change.

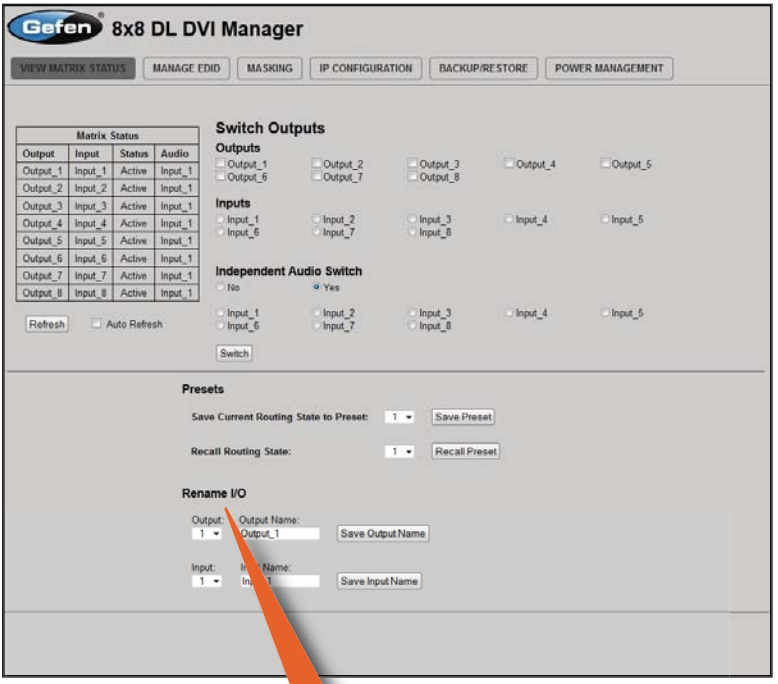


Presets
Provides saving and recalling of routing states.

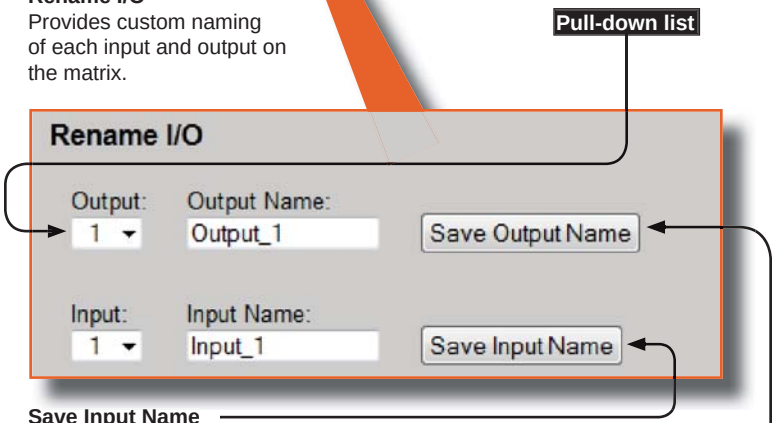
Save Preset
Click the drop-down list to select the preset location (1-8).
Click the Save Preset button to save the preset.

Drop-down list

Recall Preset
Click the down-arrow on the pull-down list to select the routing state (1-8) to recall. Click the Recall Preset button to recall the preset.



Rename I/O
Provides custom naming of each input and output on the matrix.



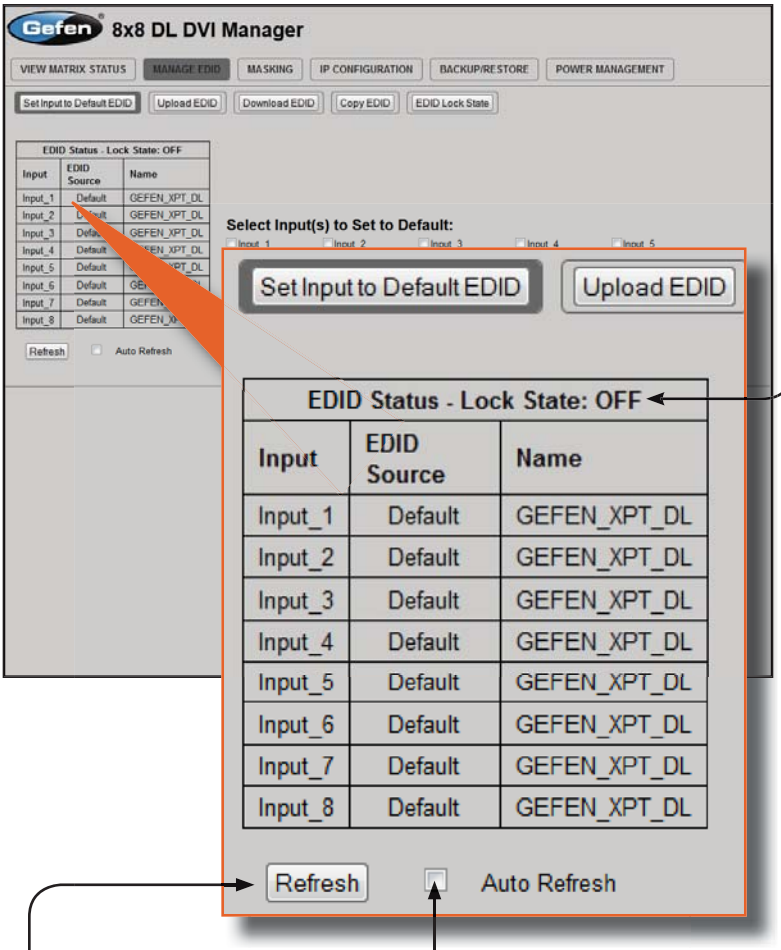
Save Input Name
Select the DVI input to rename from the pull-down list. Type the name of the input in the Input Name field. Click the Save Input Name button to save changes. See page 53 for naming restrictions.

Save Output Name
Select the DVI output to rename from the pull-down list. Type the name of the output in the Output Name field. Click the Save Output Name button to save changes. See page 54 for naming restrictions.

Manage EDID

Set Input to Default EDID

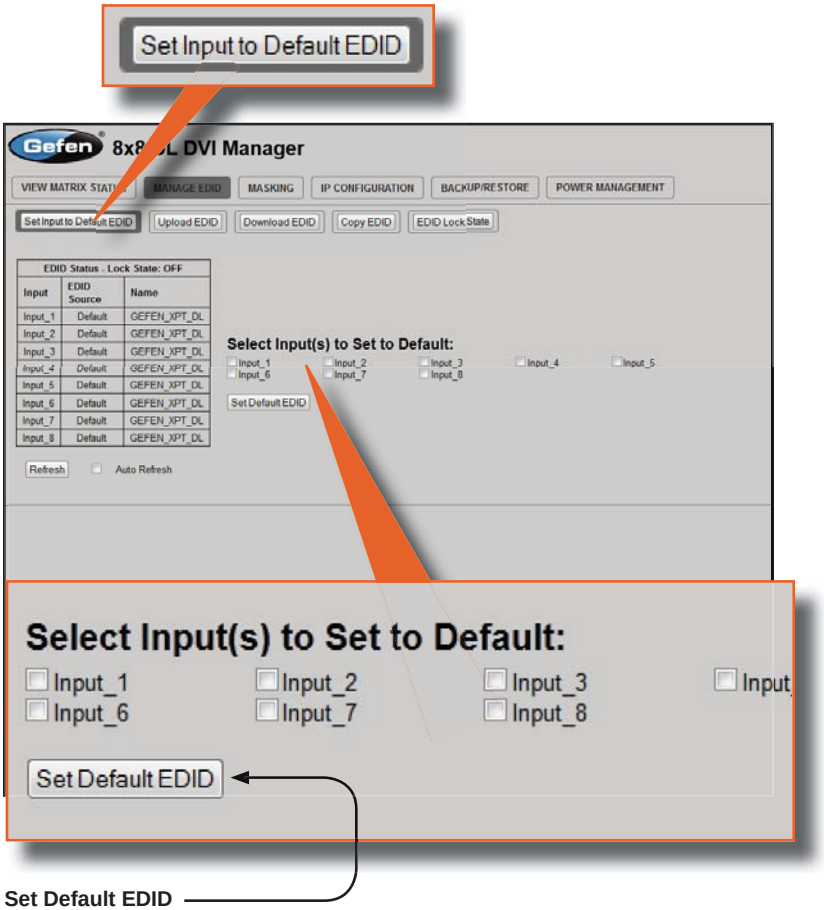
EDID Status
Displays the current EDID status for each input on the matrix and indicates the current Lock State.



Refresh
Click to refresh the Matrix Status screen

Auto Refresh
Check this box to enable Auto Refresh. Auto Refresh will automatically update the screen every 10 seconds.

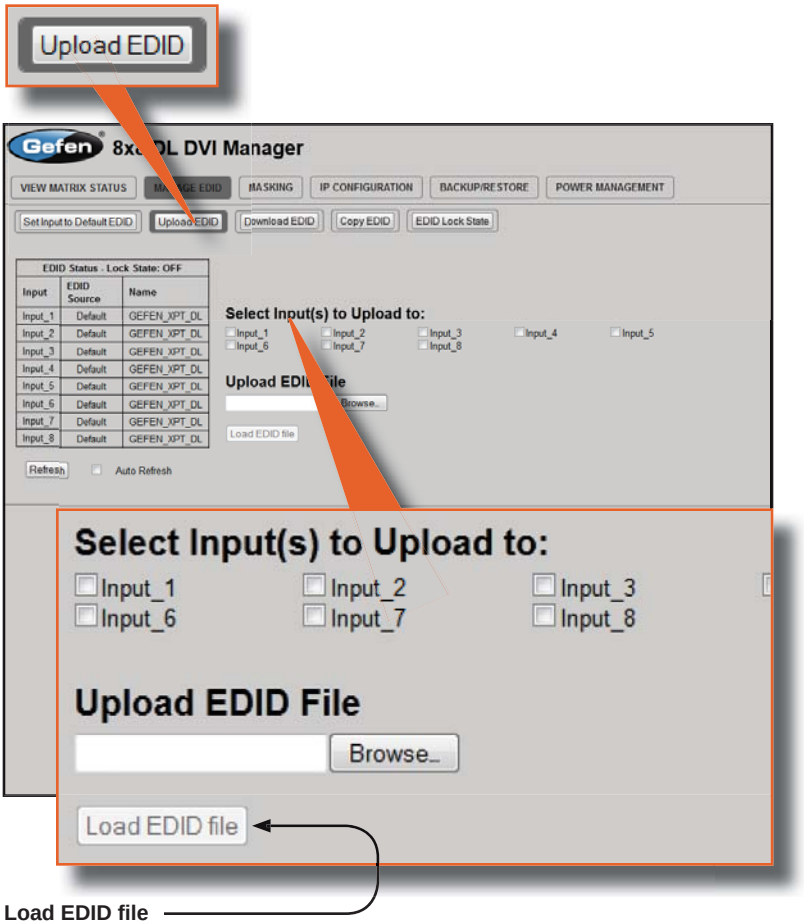
Set Input to Default EDID
Press this button from the Manage EDID screen to access this menu system.



Set Default EDID
Place a check mark next to the input(s) that should be set to the default EDID. Click the Set Default EDID button to apply the default EDID to the selected inputs.

Upload EDID

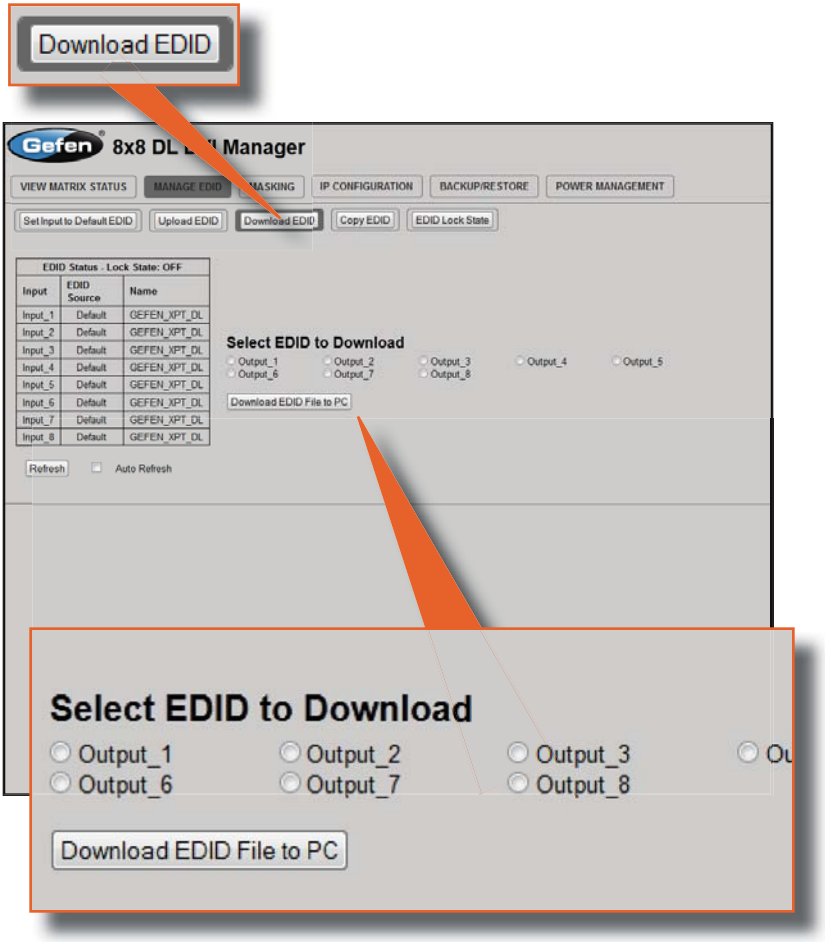
Upload EDID
Press this button from the Manage EDID screen to access this menu system.



Load EDID file
Place a check mark next to the input(s) that will receive the EDID data from the file. The EDID file must be in .bin format. Click the Browse button to locate the EDID on the computer. Click the Load EDID file button to upload the EDID file to the matrix.

Download EDID

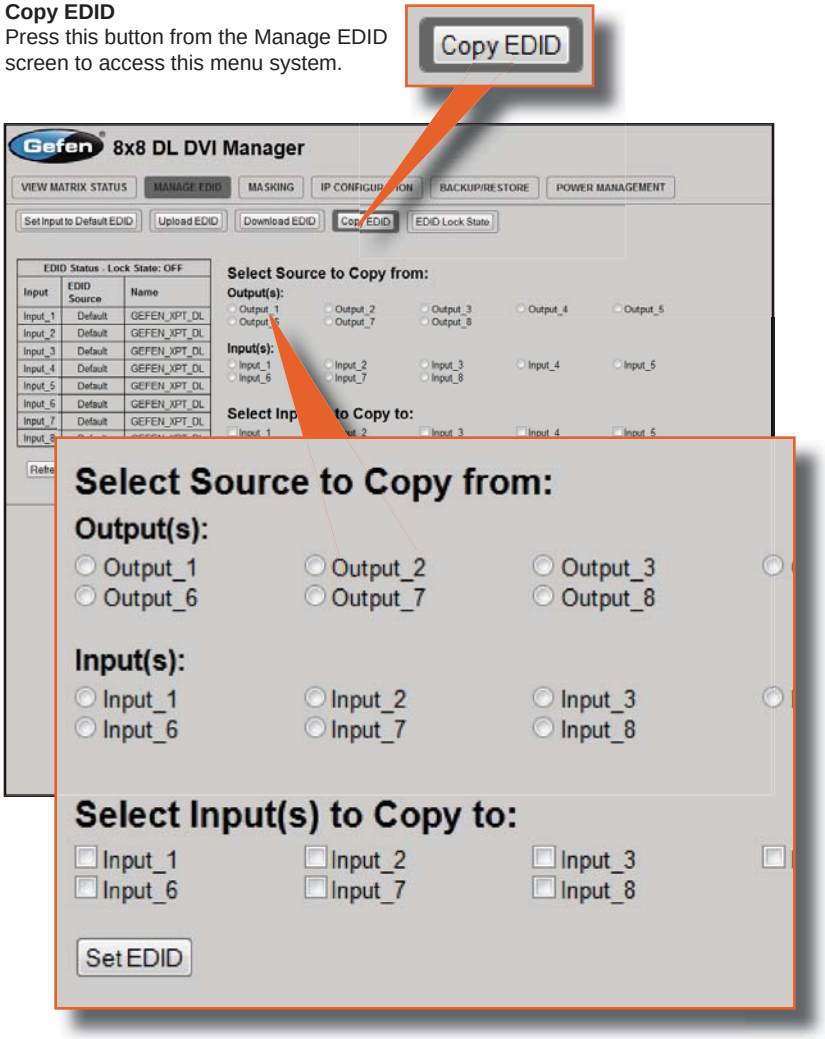
Download EDID
Press this button from the Manage EDID screen to access this menu system.



Download EDID File to PC
Select the radio button next to the output, containing the EDID to be downloaded. Click the Download EDID File to PC button to confirm the change. The downloaded EDID file will be in .bin format.

Copy EDID

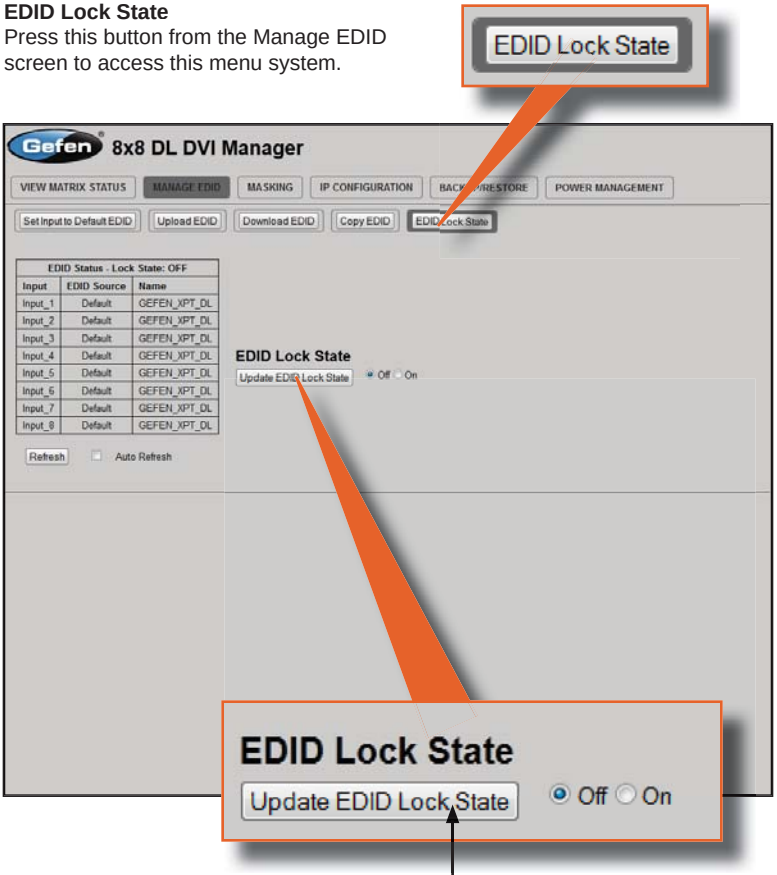
Copy EDID
Press this button from the Manage EDID screen to access this menu system.



Select Source to Copy from / Select Input(s) to Copy to
Click the radio button next to the input or output containing the EDID to copy. Note that only a single input or output can be selected at a time. Place a check mark next to the input(s) where the EDID will be copied. Click the Set EDID button to confirm the operation.

EDID Lock State

EDID Lock State
Press this button from the Manage EDID screen to access this menu system.

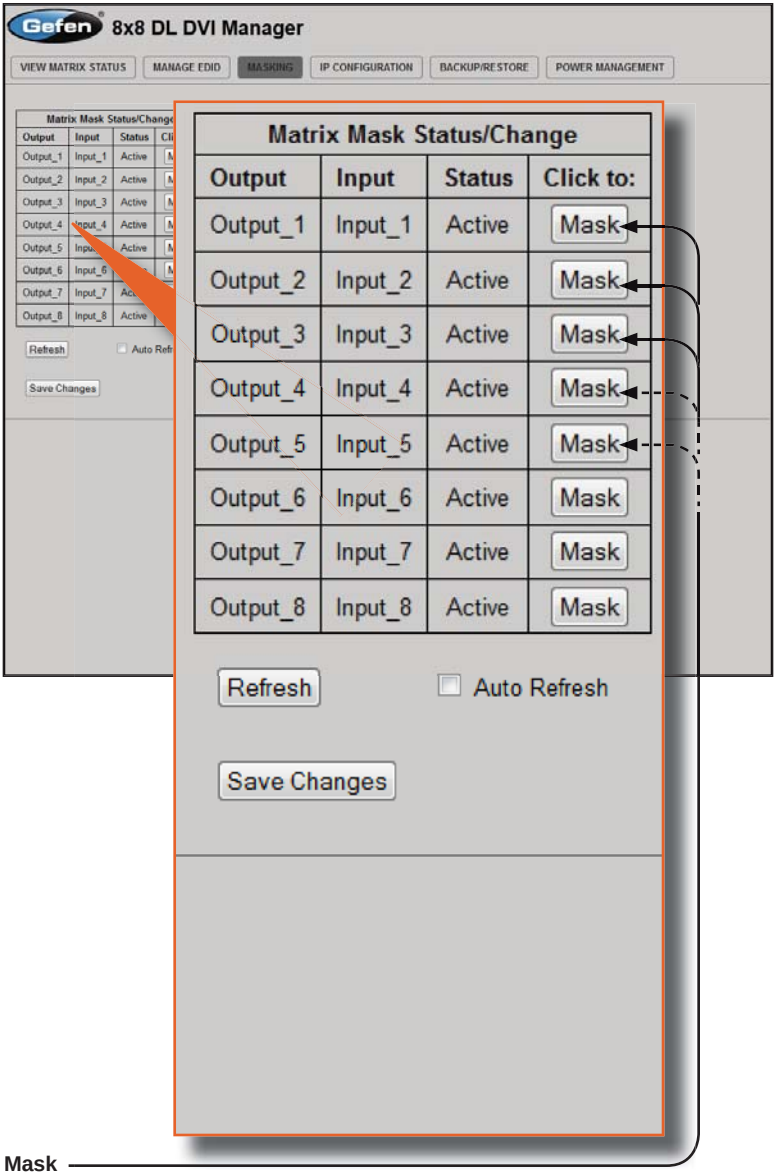


Update EDID Lock State
Secures the Local EDID and disables the automatic loading of the downstream EDID after the Matrix is powered on. Select the radio button next to the Off or On option then click the Update EDID Lock State button to apply the change.

The EDID Lock State has no effect when the Dynamic EDID function is activated.

Masking

Matrix Mask Status / Change
Displays the current masking status for each output.

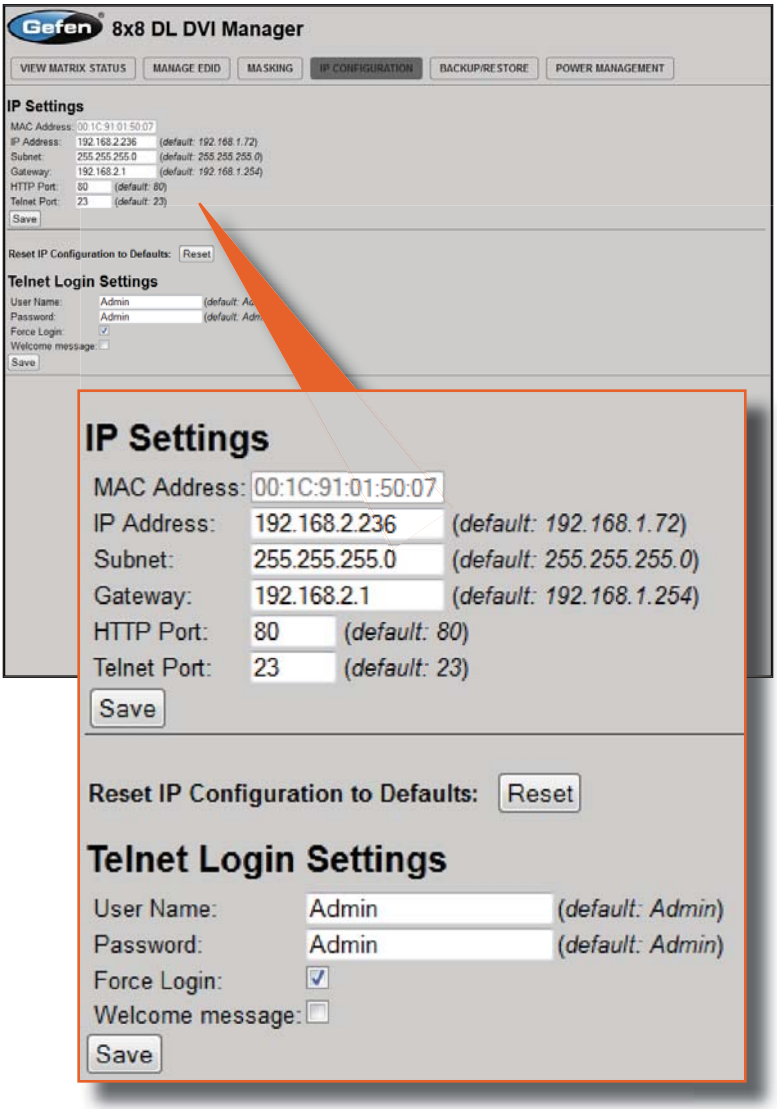


Mask
Click the Mask button to mask the selected output. If the output is already masked then the button will read “Active” (enabled). Click the (“Active”) button again to toggle the masking state to “Mask” (disabled).

IP Configuration

IP Settings

Assigns IP address, subnet, gateway, HTTP listening port, and Telnet port. Note that the MAC address can not be changed. Click the Save button to apply changes. The matrix must be rebooted for the changes to take effect.

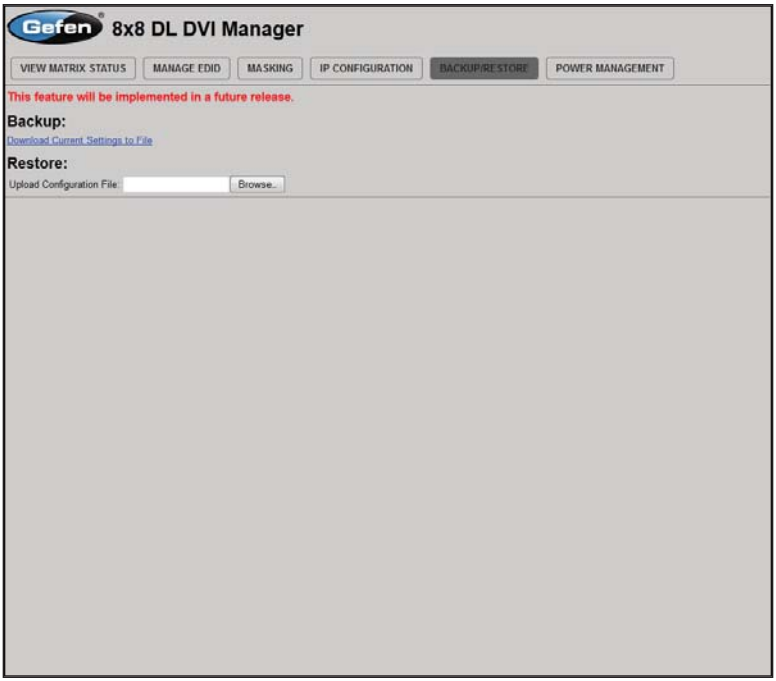


Telnet Login Settings

Sets the user name and password for Telnet sessions to the matrix. Click the Save button to apply changes.

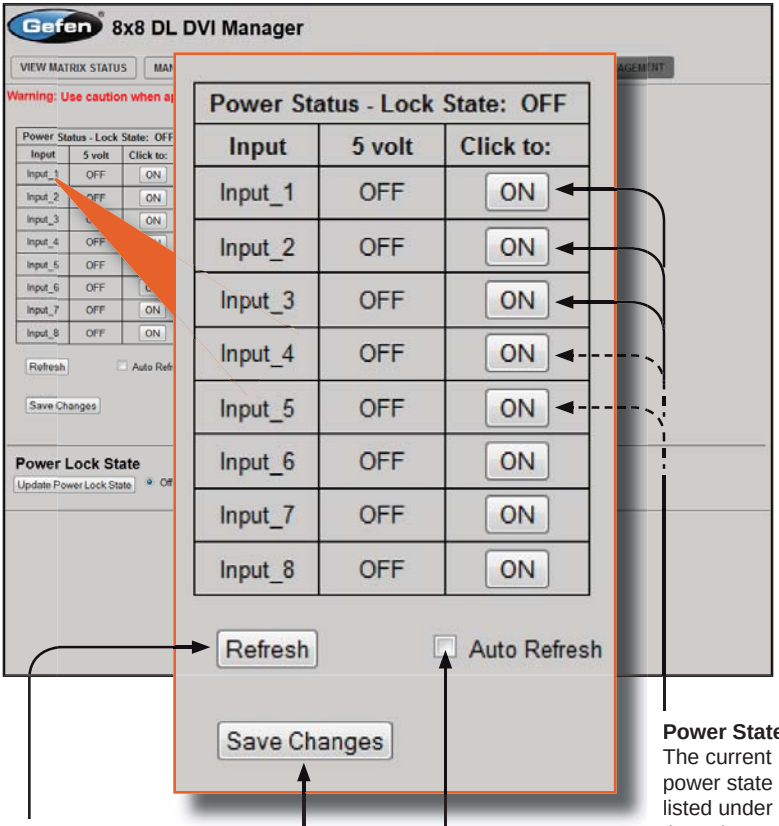
Backup / Restore

The Backup / Restore feature for the 8x8 DVIKVM Dual Link Matrix is not currently implemented and will be available in a future release of the firmware.



Power Management

Power Status
Enabling this feature will store the +5V status for that input prior to shutting down the matrix. This preserves the +5V state when the unit is restarted.



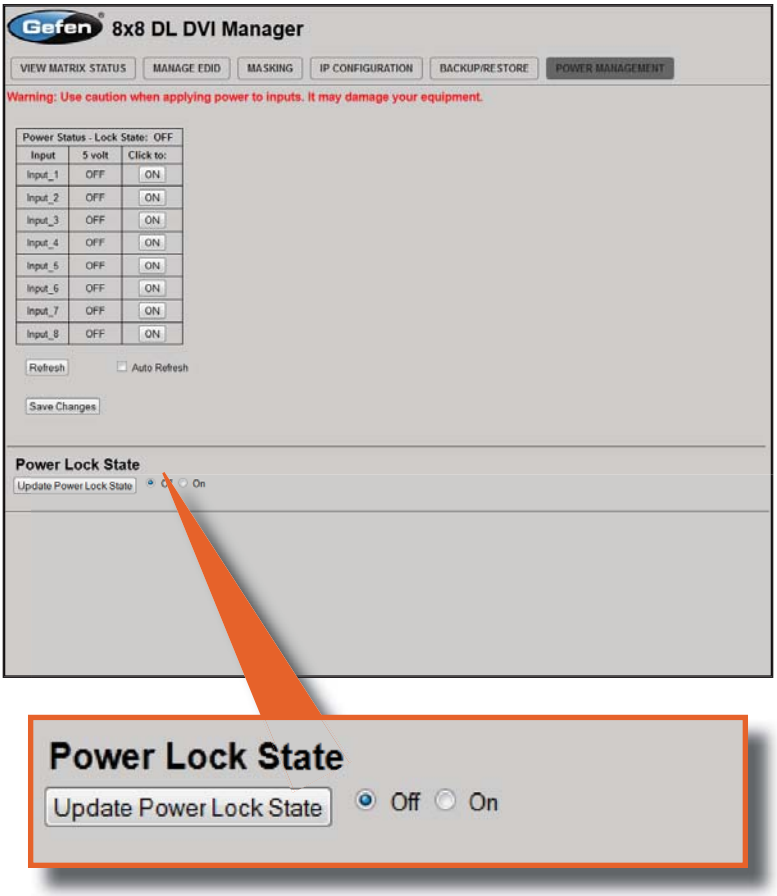
Refresh
Click to refresh the Power Status screen

Save Changes
Click to save the power lock status.

Auto Refresh
Check this box to automatically update the screen every 10 seconds.

Power State
The current power state is listed under the column titled “5 Volt”. Click these buttons to toggle the input power state.

WARNING: Use caution when applying power to inputs, as this may damage your equipment.

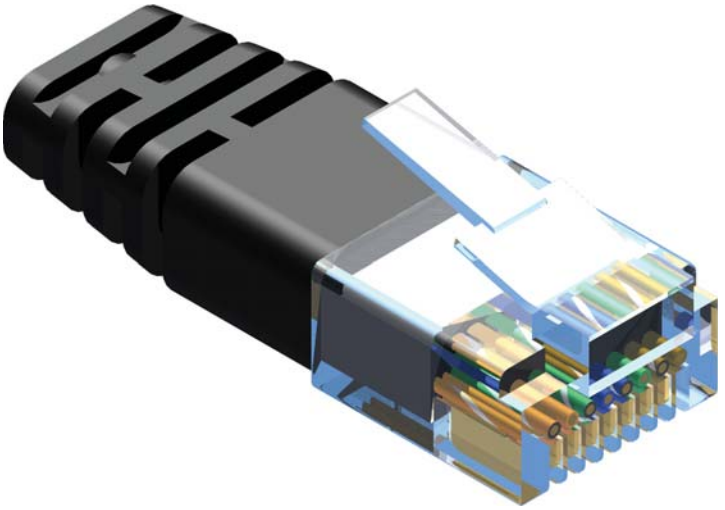


Power Lock State
In the case of an accidental power loss to the matrix, the +5V state for each input can be preserved.

Set the specified Power Status buttons (see previous page) and click the radio button next to ON. Click the Update Power Lock State button to apply changes.

By default, this option is set to Off.

NETWORK CABLE WIRING DIAGRAM



Gefen recommends the TIA/EIA-568-B wiring option. Please adhere to the table below when field-terminating the cable for use with Gefen products.

Pin	Color
1	Orange / White
2	Orange
3	Green / White
4	Blue
5	Blue / White
6	Green
7	Brown / White
8	Brown

Cabling comes in stranded and solid core types. Gefen recommends using solid core cabling.

It is recommended to use one continuous run from one end to the other. Connecting through a patch is not recommended.

Firmware Update Procedure

The following items are required to update firmware:

- RS-232 Terminal (e.g. Windows-based PC running HyperTerminal).
- RS-232 cable (do not use a null-modem cable)
- Firmware files: DVI8x8 and GEFMTXFP

To begin the update procedure the matrix Boot Loader must be activated. To activate the Boot Loader please follow the procedure below:

1. Power-on the matrix.
2. Connect an RS-232 cable to the PC and open the terminal program using the following settings:

   Baud rate: 19200
   Stop bits: 1
   Data bits: 8
   Flow control: None

3. Type the command: `#activebolo`

   Two options will be provided:

   To download the file DVI8x8 please type the command ‘activebolo 0’
   To download the file GEFMTXFP please type the command ‘activebolo 1’

4. Type the command: `#activebolo 0`

   This will begin the update process of the main board.

5. Once the Boot Loader is activated the following message should appear:
6. Press [1] on the computer keyboard to begin downloading program to the temporary memory

```
DVI8x8 Boot Loading
================== Main Menu ============================
Download new program -------- 1
Cancel ---------------------- 2
_________________________________________________________
```

7. Press [1] on the computer keyboard to begin downloading program to the temporary memory.

8. A message will appear in the terminal program:

   ```
   Waiting for the file to be sent ... (press 'a' to abort)
   ```

9. In Hyperterminal, click Transfer > Send file...

10. Click Browse... and select the .BIN file corresponding to the boot loader which was activated. In this first case, the file should start with DVI8x8.

11. Select Ymodem for the protocol.

12. Press Send on the Send File dialog box.

13. A message will appear in Hyperterminal:

    ```
    Programming Completed Successfully!
    ```

14. The unit will exit the boot loader screen and return to the standard Hyperterminal window.

15. Repeat steps 3 - 12 for the file GEFMTXFP.

a. Maximum recommended ambient temperature: 45 ˚C (104 ˚F).

b. Increase the air flow as needed to maintain the recommended temperature inside the rack.

c. Do not exceed maximum weight loads for the rack. Install heavier equipment in the lower part of the rack to maintain stability.

d. Connect a bonding wire between an approval safety ground stud on the chassis.

SPECIFICATIONS

Maximum Pixel Clock.....2 x 165 MHz

Input Video Signal.....1.2 volts p-p

Input DDC Signal.....5 volts p-p (TTL)

DVI Input Connectors..... (8) DVI-I 29 pin female

DVI Output Connectors..... (8) DVI-I 29 pin female

IR Extender.....3.5 mm mini-stereo

RS-232 Interface.....DB-9 female

IP Interface.....RJ-45

Power Supply.....100 ~ 240 V AC (IEC connector)

Power Consumption.....70 Watts (max.)

Operating Temperature.....0 ˚C ~ 45 ˚C / 32 ˚F ~ 113 ˚F

Storage Temperature.....-20 ˚C ~ 60 ˚C / -4 ˚F ~ 140 ˚F

Relative Humidity.....20% ~ 90% RH (no condensation)

Rack Size.....2U

Dimensions.....19.0” W x 3.5” H x 4.2” D

Shipping Weight.....28.1 lbs.

WARRANTY

Gefen warrants the equipment it manufactures to be free from defects in material and workmanship.

If equipment fails because of such defects and Gefen is notified within two (2) years from the date of shipment, Gefen will, at its option, repair or replace the equipment, provided that the equipment has not been subjected to mechanical, electrical, or other abuse or modifications. Equipment that fails under conditions other than those covered will be repaired at the current price of parts and labor in effect at the time of repair. Such repairs are warranted for ninety (90) days from the day of reshipment to the Buyer.

This warranty is in lieu of all other warranties expressed or implied, including without limitation, any implied warranty or merchantability or fitness for any particular purpose, all of which are expressly disclaimed.

1. Proof of sale may be required in order to claim warranty.

2. Customers outside the US are responsible for shipping charges to and from Gefen.

3. Copper cables are limited to a 30 day warranty and cables must be in their original condition.

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For the latest warranty coverage information, refer to the Warranty and Return Policy under the Support section of the Gefen Web site at www.gefen.com.

PRODUCT REGISTRATION

Please register your product online by visiting the Register Product page under the Support section of the Gefen Web site.

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